Abstract Submitted to the
International Conference on Strongly Correlated Electron Systems
University of Michigan, Ann Arbor
August 6-10, 2001

LiV_2O_4: evidence for a two-stage screening process

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LiV_2O_4, a frustrated mixed valent metal ($d^1 \leftrightarrow d^2$), is argued to undergo two spin-screening processes. The first quenches the effective spin to produce the spin $\frac{1}{2}$ behavior seen below room temperature* , while the second produces the heavy fermi liquid character seen at low temperatures†. We present a t-J model with strong Hund's coupling of the strongly correlated d-electrons. Valence fluctuations of the Hubbard operators (S = $\frac{1}{2} \leftrightarrow 1$) combined with the frustration of the underlying corner-shared tetrahedral vanadium lattice are the essential components of our model.

*Kondo et al., PRB **59**, 2609
†Urano et al., PRL **85**, 1052